APPLICATION

FOR

UNITED STATES LETTERS PATENT

ENTITLED

DISTRIBUTED SEARCH SYSTEM AND METHOD

TO WHOM IT MAY CONCERN:

BE IT KNOWN THAT DR. LARRY R. HARRIS of 94 Annursnac Hill
Road, Concord, MA 01742 invented certain new and useful
improvements entitled as set forth above of which the following
is a specification:

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1   Docket No.: EZM-001.01

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3   DISTRIBUTED SEARCH SYSTEM AND METHOD

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5   CLAIM OF PRIORITY

6   This application claims priority to U.S.S.N. 60/221,546

7   entitled "Distributed Natural Language Search Method", naming

8   Larry R. Harris as inventor, and filed on 28 July 2000, the

9   contents of which are herein incorporated by reference in their

10   entirety.

11

12   BACKGROUND

13   (1) Field

14   The systems and methods relate generally to search systems

15   and methods, and more particularly to efficiently locating and

16   accessing information across a communications network such as the

17   internet.

18   (2) Description of Related Art

19   The internet provides a single conduit to reach a supplier

20   of a product or information that can be located, in some cases,

21   throughout the world. One challenge for internet customers or

22   consumers, and hence internet businesses, is knowing the

23   suppliers to contact, and how to gain proper access to the

24   suppliers. The success of commerce on the internet therefore

depends on customers' ability to locate products and/or information easily and quickly; however, industry statistics indicate that over seventy percent of potential customers to internet websites leave the websites without finding their desired product(s)/information. This result is not desirable for the website in generating profits directly through internet sales, or indirectly through advertising revenue.

First generation techniques for finding products and/or information on the internet were advertiser-based and listed websites, rather than individual products. Second generation techniques involved aggregating product and other information from multiple supplier sites (product catalogs) at online shopping malls or business-to-business "vortals" to allow consumers to access consolidated listings across multiple suppliers. It is anticipated that the next generation supplier networks may dynamically access information from relevant suppliers in response to a buyer's requirements and present only the suppliers and products that precisely meet the consumers' needs.

SUMMARY

The present disclosure provides a system and method for performing a search of data sources that can reside on a network such as the internet. The search can be specific to the content

and organization of the data sources. The search can also be a distributed search to multiple data sources. Data sources can include textual documents such as web pages that can include program instructions, and other types of text documents, text files, and databases, although other data sources can be included. The data sources can reside on one or more servers or other devices on a network. Searches or queries can be initiated using natural language expressions, sentences, keywords, or combinations thereof, from which data source content-specific queries can be generated and executed. In some embodiments, a dynamically generated customized query can be formed and issued for each data source to be searched or queried.

In one embodiment, the methods and systems can provide an application that can be installed on a subscriber's server to allow a website and/or other data sources accessible to the server, to be searched without requiring pre-integration, reformatting, etc. of the server or the data on the server. In another embodiment, the application can reside on another device or server that can be in communication with the subscriber's website server. For the purposes of the methods and systems described herein, a "website" can be understood to include a document on a network such as the internet or an intranet, that can include a home page and other documents and files that can be accessed through the webpage either directly or indirectly, and

the website can also include databases that can be accessed directly or indirectly. The application can develop a customized query for the website and/or other data sources accessible to the server, using wired or wireless communications systems and protocols.

When a subscriber maintains a product catalog database, for example, the installed application can access the database and build a customized dictionary that can convert a natural language or keyword search query to a precise SQL query for the subscriber's product catalog database. Additionally and optionally, if the target of the search is text, the installed application can build a custom dictionary can generate an advanced text search of the website using one or more standard text search engines that may be otherwise installed at or available to the website.

In some embodiments, the methods and systems can allow an internet user or other internet accessible entity, including non-human entities, to initiate a search from, for example, a website. Such a website can hereinafter be referred to as an initiating website, and can be the network location from which the search can be broadcast or distributed to subscriber websites and hence, customized dictionaries. In one embodiment, the customized dictionaries can receive a HTTP command and thereafter reach behind security measures such as firewalls to access

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otherwise protected or secure data. The systems and methods can also allow subscribers to receive a search command or query information from the initiating website, utilize the subscriber's local customized dictionary to translate the search for the respective website, data source, etc., initiate a customized search of the subscriber's website, data source, etc., and extract the relevant information for submission as search results to the initiating website. In one embodiment, the search can be an SQL search or a text search.

In one embodiment, the application at a particular subscriber's server can immediately determine from the received search command and the customized dictionary, that a search may not be necessary because the website and/or data source may not include relevant information, products, services, etc.

In an embodiment, the search results from subscribers can be formatted in XML, and the initiating website can receive the multiple search results and integrate the XML results for presentation to a user at the initiating site. The results can also be formatted for presentation by email, instant messaging, or for voice. In some embodiments, the query can be submitted by email, instant messaging, or voice.

The methods and systems can produce search results that can include a subscriber (supplier) name, a product name or identifier, a product price, a product description, a product

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image, etc. In one embodiment, the user's (or querying entity's) selection of a product can provide a transition to an order basket that can be at the initiating website, the subscriber's website, or an alternate website. In one embodiment, search results can be accompanied by a URL of the order processing system that can be used to order the product; and, when the user selects the item, the relevant product information can be submitted to the purchasing system to initiate the purchase process.

The methods and systems can allow a subscriber to access and search a cooperating subscriber's website and products in a peer-to-peer relationship.

The methods and systems can accommodate customized searches. Accordingly, a user can establish an account or profile that can be transmitted or otherwise associated with the search or query request from the initiating device or website. The user's profile can be incorporated into the customized searches at the subscriber websites. In one embodiment, the user can transmit the profile with the query information or search request, while in another embodiment, the user can be identified at the initiating device or website by an account number that can allow access to a locally or centrally stored profile for submission with the inquiry. In yet another embodiment, a user can submit or otherwise be associated with a profile such that subscribers

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1 can customize a search or query based on the user profile and/or

2 identity.

3   The methods and systems can allow a user to customize the

4 presentation of search results. For example, a user can select

5 an option to view search results by price. In an embodiment, a

6 subscriber can customize or otherwise control the search results.

7   For example, a subscriber may not produce a search result for a

8 particular product unless the inventory level for that product

9 exceeds a particular value.

10   In one embodiment, subscribers can update respective

11 customized dictionaries to produce more accurate searches that

12 can reflect changes in terminology, etc. In an embodiment, a

13 dictionary can be updated locally or remotely via a wired or

14 wireless network.

15   The methods and systems can allow hierarchical searching of

16 multiple servers and/or data sources using a "broker" dictionary

17 that can receive query information and/or a search request from

18 the initiating website or device, and broadcast the request to

19 several other customized dictionaries, known as broadcast

20 dictionaries, that can be located, for example, on various

21 subscribers' servers. The broker dictionary can receive and

22 compile search results from broadcast dictionaries, and transfer

23 a single, composite search result to the initiating website. The

24 broker dictionary can be utilized as an intelligent filter to

intelligently select only specific broadcast dictionaries that may be more likely to produce relevant search results.

In an embodiment, the methods and systems can identify customized dictionaries using a URL that can allow a remote server to access the dictionary, create a local copy, modify the copy, and transmit the modified copy to the original location for re-writing, etc.

Other objects and advantages will become apparent hereinafter in the specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 displays an architectural block diagram of a system that practices the principles of the methods and systems described herein for a single data source;

FIG. 2 displays systems and methods according to FIG. 1 for an exemplary internet embodiment;

FIG. 3 displays systems and methods according to FIG. 1 for an exemplary query translation architecture;

FIG. 4 displays systems and methods according to FIG. 1 for an exemplary architecture providing query translation and retrieval;

FIG. 5 displays systems and methods according to FIG. 1 for an exemplary query translation, retrieval, and presentation architecture; and,

1   FIG. 6 is a diagram representing systems and methods in

2   accordance with the principles of FIG. 1 that include a broker

3   dictionary.

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5   DESCRIPTION

6   To provide an overall understanding, certain illustrative

7   embodiments will now be described; however, it will be understood

8   by one of ordinary skill in the art that the systems and methods

9   described herein can be adapted and modified to provide systems

10   and methods for other suitable applications and that other

11   additions and modifications can be made without departing from

12   the scope hereof.

13   Referring now to FIG. 1, there is a block diagram of a

14   system **100** that implements the techniques described herein. As

15   will become apparent herein, the techniques as described in

16   relation to FIG. 1 have many applications and embodiments, some

17   of which can be referenced herein with respect to other figures.

18   FIG. 1, and other Figures provided herein, can therefore be

19   understood to represent the techniques, and while pictorial

20   objects can be represented in the Figures, those with ordinary

21   skill in the art will understand that these pictorial objects can

22   be provided for understanding only and are not intended to be a

limitation on the methods and systems. Accordingly, pictorial

objects and their associated concepts can be combined with other

pictorial objects, or additionally and optionally, separated into

further pictorial objects, while not departing from the methods

and systems.

As FIG. 1 indicates, the techniques herein can be initiated

by a survey **102** of a data source **20**. The survey can be automated

or manually guided to identify data sources **20**. As will be

understood herein, data sources can include one or more textual

documents, databases, etc., where a textual document can be

understood to include a text file, web page, etc., that can be

formatted text such as HTML, XML, some other SGML format, or

another text format. A data source that is a database can use a

format compatible with MySQL, SQL, Oracle, Informix, Sybase, the

Freedom Engine, Access, ODBC, DB2, etc. Those with ordinary

skill in the art will recognize that the methods and systems are

not limited to the type or format of the data sources. Through

the survey **102**, the data source(s) can be analyzed with regard to

data format, data type, data organization (e.g., categorization,

hierarchical structure), relevant terms and phrases,

relationships between words, terms, and phrases, identification

of abbreviations or word/phrase variations, codes related to data

(purchase codes, product codes, price codes, or any other code
that can relate to categorizing the product in terms of price,
demographic appropriateness or characteristics, etc.) etc. Other
information related to the data source can be manually provided.

In some embodiments, the survey can be automated, and additional
information including the number of data sources, etc., can be
determined. For the purposes of illustration with respect to the
embodiment of FIG. 1, a database data source **20** is illustrated,
although such an example is provided for illustration and not
limitation, and multiple and varied format data sources,
including textual data sources, can be utilized for the methods
and systems.

A dictionary **18** can be formulated **104** based on the survey
results **102**. The dictionary **18** can be understood to be, for
example, a computer program that can be implemented in a higher
level language such as C, C++, Java, etc., that can receive query
information as input, and can provide as output, a query
formatted and otherwise customized for the data source.

Referring again to FIG. 1, query information **106** can be
received by the dictionary **18**. Although FIG. 1 illustrates only
one dictionary **18**, it can be understood that there can be

multiple dictionaries, and in such embodiments, the query information **106** can be received by the multiple dictionaries. The illustrated dictionary **18** can generate a customized query **110** based on the received query information **106** and the survey results. The customized query **110** can be applied to the data source **20** from which the survey was conducted. The customized query results **112** can, in some embodiments, be returned to the dictionary **18**. In some embodiments, the dictionary **18** can format, arrange, aggregate, etc., the customized query results **112** and transfer or forward the results. For example, the query results **108** can be transferred to the entity that requested that supplied the query information **106**, or another entity can be designated or otherwise specified to receive the query results **108**. As indicated previously herein, FIG. 1 illustrates the principles of the methods and systems which have wide applicability.

Referring now to FIG. 2, there is an architectural block diagram **10** of an illustrative system that utilizes the methods and systems for an internet application. The FIG. 1 system indicates an initiating device **12** that can include a digital computer system that can utilize a wired or wireless communications link to connect to a communication network such as

the internet. A user of the initiating device **12** can utilize different peripheral devices that can be integrated with or otherwise configured for compatible use with the initiating device **12**. For example, the initiating device **12** can include a keyboard, keypad, stylus, digital camera, microphone, etc., that can communicate data to the initiating device using wired or wireless communications systems and/or protocols, etc. The initiating device **12** can be a microprocessor-based system including a computer workstation, such as a PC workstation or a SUN workstation, handheld, palmtop, laptop, personal digital assistant (PDA), cellular phone, etc., that includes a program for organizing and controlling the initiating device **12** to operate as described herein. Additionally and optionally, the initiating device **12** can be equipped with a sound and video card for processing multimedia data. The initiating device **12** can operate as a stand-alone system or as part of a networked computer system. Alternatively, the initiating device **12** can be dedicated devices, such as embedded systems, that can be incorporated into existing hardware devices, such as telephone systems, PBX systems, sound cards, etc. Accordingly, it will be understood by one of ordinary skill in the art that the

1   initiating device **12** described herein has wide applicability and

2   can be incorporated in many systems, and realized in many forms.

3   For a system according to FIG. 1, the initiating device **12**

4   can be connected to a network such as the internet and can be

5   equipped with what is well-known as an internet "browser" such as

6   the commercially available Netscape Navigator, Internet Explorer,

7   etc., browsers, and those with ordinary skill in the art will

8   recognize that, depending upon the initiating device **12** and its

9   configuration, the browser can differ, and hence references

10   herein to a browser can include references to a user interface to

11   the internet or other network, wherein the methods and systems

12   herein are not limited to the browser or other network interface.

13   Furthermore, the initiating device **12** can access the internet

14   using wired or wireless communications links and/or protocols.

15   The initiating device **12** can communicate with a server that

16   can be represented in the FIG. 1 system as a System Server **14**.

17   The illustrated server **14** can be also be a microprocessor-based

18   system including a computer workstation, such as a PC workstation

19   or a SUN workstation, handheld, palmtop, laptop, personal digital

20   assistant (PDA), cellular phone, etc., that includes a program

21   for organizing and controlling the server **14** to operate as

described herein. Additionally and optionally, the server **14** can be equipped with a sound and video card for processing multimedia data. The server **14** can operate as a stand-alone system or as part of a networked computer system. Alternatively, the server **14** can be dedicated devices, such as embedded systems, that can be incorporated into existing hardware devices, such as telephone systems, PBX systems, sound cards, etc. In some embodiments, servers can be clustered together to handle more traffic, and can include separate servers for different purposes such as a database server, an application server, and a Web presentation server. The server **14** can also include one or more mass storage devices such as a disk farm or a redundant array of independent disk ("RAID") system for additional storage and data integrity. Read-only devices, such as compact disk drives and digital versatile disk drives, can also be connected to the server **14**. As used herein, the term "server" is intended to refer to any of the above-described servers. In an embodiment, the initiating device **12** and the server **14** can be similar systems.

In an embodiment of the FIG. 1 system, the initiating device **12** can access the server **14** via the internet, and the server **14** can provide a webpage or other interface to the initiating device **12** to allow a user of the initiating device **12** to input data

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indicative of a query for information. Those with ordinary skill in the art will recognize that this query information can be of varying formats, and can include one or more keywords and/or natural language terms or expressions that can optionally be linked using one or more logical operators, including boolean expressions or notations such as "and", "or", and "not". In some embodiments, additionally and optionally, "+" and "-" can be used to indicate desired and undesired terms, respectively, for example. Those with ordinary skill in the art will recognize that there are many different connectors and methods of relating keywords, sentences, questions, and/or natural language words or expressions that can be used.

For the purposes of the discussion herein, natural language can be understood to be a word, phrase, grouping of words, etc., in a language written or spoken by humans.

Additionally and optionally, the query information can include a full text statement or question or other natural language data. The query information can be entered to the initiating device **12** and thereafter edited using one or more of multiple peripheral devices connected to the initiating device that can include a keyboard, keypad, stylus, mouse, microphone,

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etc., wherein those of ordinary skill in the art will recognize that the methods and systems herein are not limited to the mechanism of inputting query information to the initiating device **12**. Furthermore, the methods and systems are not limited to the format of inputting the query information or a user interface that can be provided to facilitate such entry. For example, in some embodiments, the query information can be input using one or a combination of text input boxes, text documents, menu selections, drop-down boxes, radio buttons, etc. The illustrated initiating device **12** also can provide a user with the ability to initiate the search, and in one embodiment, search initiation can be understood as entering the query information.

Furthermore, the query information can be entered by a variety of formats, including human users that can utilize peripheral devices and/or integrated software to enter and/or retrieve data by, for example, a keyboard, stylus, voice commands, etc. In some embodiments, the query information can additionally and optionally be provided by automated and/or non-human sources using scripts or other programming techniques. Accordingly, references herein to a user of the initiating device **12** can be understood to include any entity, human or non-human,

1   that can cause query information to be provided to the initiating

2   device **12**.

3   Upon initiation of a search or query by a user of the

4   initiating device **12**, for the FIG. 1 system, the initiating

5   device **12** can transfer the query information to the server **14**

6   that can include a list of subscribers that can be included, in

7   one embodiment, in a database **13**. The subscriber database **13** can

8   be accessed locally or through a network such as the internet

9   using wired or wireless communications devices and protocols.

10   The subscriber database **13** can be understood to include a memory

11   having one or more physical or logical partitions and/or

12   segments, and can optionally and additionally utilize one or more

13   of well-known database packages including MySQL, SQL, Oracle,

14   Informix, Sybase, the Freedom Engine, Access, ODBC, DB2, etc.,

15   with such examples provided for illustration and not limitation.

16   In an embodiment, the database **13** can reside in a memory of the

17   server **14**.

18   In an embodiment, the server **14** can access subscriber

19   information from the database **13** to cause the query information

20   to be distributed to one or more subscribers **16a, 16b, 16c**. In

21   the illustrated system, the database **13** can include URLs of

1   subscriber servers **16a, 16b, 16c** (also referenced herein

2   collectively or individually as **16**). The query information can

3   be transferred, distributed, or otherwise communicated to the

4   subscriber servers **16** simultaneously as in a broadcast, or using

5   an ordered scheme that can include network or load balancing

6   schemes. The FIG. 1 system illustrates the communication of

7   query information to three subscribers **16a, 16b, 16c** although the

8   methods and systems can be applied to one or more subscribers and

9   the number of subscribers is not a limitation. For an embodiment

10   wherein the system server **14** communicates to the subscriber

11   servers **16** via a network such as the internet, the transfer of

12   the query information can be performed using HTTP or HTTPS, for

13   example, although such an example is provided for illustration

14   and not limitation.

15   The illustrated subscribers **16a, 16b, 16c** can be servers as

16   described previously herein with respect to the System Server **14**.

17   The servers **16** can include one or more data sources **20a, 20b,**

18   **20c, 20d** (also referenced herein collectively or individually as

19   **20**). The subscribers **16** also include a dictionary **18a, 18b, 18c,**

20   **18d** (also referenced herein collectively or individually as **18**)

21   that can be associated with and based on the data sources **20a,**

22   **20b, 20c, 20d**. In an embodiment such as that of FIG. 1, a data

source **20** can be associated with a dictionary **18**, although in some embodiments, one dictionary **18** can be associated with more than one data source **20**. Alternately, in an embodiment, one data source **20** could be associated with more than one dictionary **18**.

For the illustrated systems and methods, as described previously herein, a dictionary **18** can be understood to be a translator between the received query information, received from the System Server **14** as described herein, and a data source **20**. For the illustrated systems where one dictionary **18** corresponds to a data source **20**, a dictionary **18** can be formed by installing a computer program on the subscriber server **16**. In an embodiment, the computer program can be run from a remote location via a network. As indicated previously, in some embodiments, the survey computer program can be understood as a survey engine that examines the data sources **20** on the server **16**. As indicated previously, the dictionary **18** can incorporate the survey engine results to provide a customized interface between received query information, and the data source **20**.

For example, if the data source **20** is a database, the survey engine can identify labels of tables, rows, and columns, and abbreviations of labels, when necessary. This survey information

can be incorporated into a dictionary **18** to allow received query information to be properly translated for the database.   In the case of a database, query information from a user of the initiating device **12** can be an input to a dictionary **18**, and the dictionary output can be a customized SQL query that uses terminology, abbreviations, etc., derived from the survey engine. In some embodiments, the dictionary output can be a customized HTTP search string that can utilize a general access method that can be created for the data source (e.g., the HTTP search string can be formatted based on drop-down menus/boxes, radio button selections, and/or other general access provisions).   In an example of a database embodiment, a database can be configured with columns or rows that relate to colors that are abbreviated, such as "Rd" for Red, "Bl" for Blue, etc. If query information is submitted with the word "Blue", the customized dictionary can cause a customized query to be formatted using "Bl" according to the survey information. Accordingly, row information and column information can be understood herein to include a characterization of the database information that can include header information, element information, extraneous information that can otherwise provide insight to the database, etc.

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Additionally and optionally, when the data source **20** is text, the survey engine can scan the text, identify synonyms, abbreviations, etc., for incorporation into a dictionary **18**. A dictionary for a text data source **20** can format received query information into an advanced text query that can utilize a standard text engine. Some examples of standard text engines can include AltaVista, Excite, Google, Infoseek, Inktomi, Microsoft Index Server, etc., although such examples are provided for illustration and not limitation. Optionally and additionally, the dictionary can convert the received query information into a HTTP query that can be formatted according to a web page on the server **16**, where the web page can include text input boxes, radio buttons, drop-down boxes, check-boxes, etc.

The illustrated dictionaries **18** can also include a natural language and linguistic processor that is well-known in the art for parsing received information, performing context analysis, generating synonyms, etc. The dictionaries **18** also include a spell corrector that can verify word spellings and generate phonetic equivalents, although such features can reside independent of the spell corrector. The dictionaries **18** can also perform word variations to better interpret and/or distinguish words, for example, between similar words such as "build",

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"builder", and "building." Furthermore, the dictionaries **18** can perform phrase identification that includes identifying word groups within context. For example, "wrinkle-free" can be interpreted with respect to clothes, or in another manner with respect to plastic surgery. Accordingly, it can be understood that the dictionaries **18** for the illustrated systems and methods can extend the received query information to include terminology that is compatible with, understood by, and/or interpreted by a data source **20** to which the dictionary **18** corresponds.

A dictionary **18** can be equipped with a foreign language translator to convert received query information from one language, to another language that is compatible with the data source **20**. In some embodiments, a dictionary **18** can be established for different languages, while in another embodiment, a single dictionary **18** can translate queries for multiple languages.

A dictionary **18** can determine that received query information from the initiating device **12** is not compatible with the data source **20** or otherwise cannot be interpreted. In an embodiment, the dictionary **18** can generate a list of possible interpretations for a user of the initiating device **12** to select.

1   Additionally and optionally, the dictionary **18** can cause the

2   initiating device **12** to provide a user with a request for

3   additional, alternate, or restated query information.

4   A dictionary **18** can also identify a Frequently Asked

5   Question (FAQ) and supply either a pre-defined answer to a user

6   at the initiating device **12**, or redirect the user to, for

7   example, a web page that includes an answer. A dictionary **18** can

8   also recognize and respond appropriately to query information

9   that seeks a "yes" or "no" answer, time-based queries using date

10   or time terminology including "now", "last month", "before",

11   "between", etc., and arithmetic queries that can include

12   mathematical concepts such as "lowest-priced", "top 5", "less

13   than", etc.

14   In the illustrated systems and methods, results of a

15   customized data source search can be provided to a dictionary **18**,

16   and the dictionary **18** can thereafter organize, format, etc., the

17   search results for return to the initiating device **12**. The

18   information can be presented via the subscriber server **16** to the

19   System Server **14** and hence to the initiating device **12**, or

20   directly from the subscriber server **16** to the initiating device

21   **12**. In one embodiment, the search results can be formatted in

1   XML to allow the server **16** to format the results according to a

2   web application that can be executing on the subscriber server

3   **16**. For example, the XML output from the dictionary **18** can be

4   used in Extensible Stylesheet Language (XSL) stylesheets or other

5   web formatting options. Those with ordinary skill in the art

6   will recognize that many formats for the dictionary output can be

7   utilized, and the use of XML herein is provided for illustration

8   and not limitation. For example, in one embodiment, HTML

9   templates can be utilized to present search results directly to

10   an internet browser without requiring additional programming.

11   Other forms of SGML documents or other textual formats can be

12   used without departing from the scope of the techniques provided

13   herein. Alternately, search results can be presented graphically

14   using bar charts, pie charts, histograms, Excel compatible

15   spreadsheets, etc. Search results can also be saved as an Excel

16   compatible file for later analysis. Additionally and optionally,

17   the methods and systems herein can allow the search results to be

18   provided to an application through a variety of Application

19   Programmer Interfaces (APIs).

20   In some embodiments, the requested query information can

21   provide significant search results. The methods and systems

22   herein can provide the search results using a format that

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1 includes categories and sub-categories from which a user at the

2 initiating device **12**, for example, can further select. Aggregate

3 data can also be presented with hyperlinks to detailed

4 information to allow users to retrieve further information

5 without providing further details, follow-up questions, etc.

6 Those with ordinary skill in the art will thus recognize that

7 although the methods and systems presented herein are provided

8 with respect to an internet illustration that includes browsers,

9 etc., other interfaces can be utilized to retrieve query

10 information and present query results.

11 A user or system manager associated with a server **16** can

12 provide or otherwise designate filtering schemes for providing

13 search results. A subscriber, for example, can determine to

14 exclude products from particular users based upon a received

15 profile (i.e., age, etc.). Those with ordinary skill in the art

16 will recognize that there are many parameters by which a

17 subscriber can filter or otherwise customize the search results.

18 The methods and systems can operate with security measures

19 that can be established by a system manager related to a server

20 **16**. For example, query information can be received or otherwise

21 associated with identity information. A dictionary **18** can be

configured to prevent the query information from being applied to a data source for which the user is not allowed to otherwise access. In such an embodiment, the methods and systems herein can be incorporated behind a firewall.

Those with ordinary skill in the art will recognize that the methods and systems can also be practiced outside of a firewall. In such an embodiment, a distributed or other search can be performed across a network such as the internet or an intranet, wherein accessibility to the data sources may not be protected by a firewall. As indicated previously, search results can be aggregated at the initiating device **12** or another remote device for presentation to a user.

A dictionary **18** can also generate an output log that can be understood to be a computer file that can be accessed by a system administrator or other authorized individual or entity according to the server **16** configuration or other authorization scheme. The log file can be stored locally on the server **16** or another memory device connected to the server **16** through a wired or wireless network. The log files can be configured to provide data pertaining to received query information, customized search queries, generated search results, query identity, data source

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identity, time of query, etc., with such examples provided only
for illustration. By editing the log file, a system
administrator can view the effectiveness of the dictionary with
respect to query information, desired results, security, etc.
Filters can be applied to the log files to provide log results
based on results generated, date, time of day, time period, etc.

In the illustrated embodiments, a system administrator or
other authorized user can edit a dictionary **18** to further
customize the dictionary **18**. Such edits can result from an
analysis of the log file, for example. Dictionary edits can also
be performed to further enhance business objectives. For
example, automated, scheduled searches can be performed to query
databases for stock information, etc. In an embodiment, an email
can be generated based on a search. For example, in an automated
search established by an administrator to verify stock quantity,
once a stock quantity reaches a predetermined value, an email can
be sent to the administrator and/or another interested party.

A system manager or other authorized user can also customize
a dictionary **18** and provide rules against which searches can be
performed and search results can be presented. For example, a
system manager can edit the dictionary to include a formula or

rule for determining a profit margin, and have results presented
in order of profit margin. Other rules could present results by
vendor, product availability, price, etc., with such examples
provided for illustration and not limitation. Such manual
customization of a dictionary **18** can be performed and applied
according to a particular user, or a group of users. The
dictionary editing can be performed locally or via a network.

In some practices of the systems and methods, system
requirements can provide for certain query information to be
provided. If the query information is not provided by the user
at the initiating device **12**, the user can be prompted to enter
the remaining information.

Accordingly, a dictionary **18** can include one or more of
relevant content and/or values from a data source **20**, a
representation of schemas, relationships, and category
hierarchies from the data source **20**, configuration settings
according to users and/or groups of users, business rules,
terminology definitions or specifications, synonyms, a language
translator, a natural language processor, an output data
formatter, and a log file generator.

The methods and systems herein can also allow for the aggregation of customized query results from multiple data sources and/or dictionaries. For example, as provided herein, query information submitted at an initiating device **12** can be broadcast to one or more dictionaries in broadcast or some other sequenced manner, wherein the search results can be filtered or otherwise aggregated at the System Server **14**. The filtering or other presentation of information performed by the System Server **14** can be performed additionally and optionally to filtering and organization that can be performed at individual dictionaries **18** and or servers **20**.

Referring now to FIG. 3, there is a diagram representing the methods and systems in an embodiment that can be known as a query translation embodiment **30**. In the FIG. 3 configuration, query information can be presented to the system **32** through an API **33** and to a query translator **34**. The query translator **34** can translate the query information into a SQL statement, advanced text search expression, HTTP call, etc, by accessing a dictionary **18** that corresponds to a data source **20** to be searched. For the FIG. 3 embodiment, a server **16** can provide the received query information to the system **32** to receive from the system **32** via the query translator **34**, a SQL statement, advanced text search

expression, HTTP call, etc. The server **16** can thereafter submit

or apply the returned search to a relational database, text

search engine, etc.

Referring to FIG. 4, there is a diagram of a configuration **40** for the methods and systems that can allow the return of a data set for formatting a search request, by an application that can reside on the server **16** or another device. As indicated by FIG. 3, query information can be provided by the server **16**. The query information can include or be accompanied by a dictionary selection, a user ID, business rules, etc., and a desired output format to the system **42** through its API **33**. This interface can be implemented using HTTP, Component Object Module (COM), Java, Enterprise, Javabean, C, C++, Visual Basic, or another well-known method. The natural language query, dictionary selection, and output format can be input to a query processor **44** that includes a data access module **46** that transfers the query information and dictionary selection to a query translator **34**. The query translator **34** can utilize the specified dictionary **18** and query information to generate a customized query as provided herein. Those with ordinary skill in the art will recognize that although FIG. 4 depicts a single dictionary **18** and query translator **34**, the embodiment of FIG. 4 can include multiple dictionaries and/or

query translators. The customized query can be transferred to the data access module **46** that can issue the customized query to the data source **20** corresponding to the query. FIG. 4 demonstrates two data sources **20** that include a relational database management system **20a** and a text search engine **20b**, although other data sources can be utilized and specified. The customized query search results can be returned to the data access module **46** and thereafter transferred to the formatting module **48** with the specified output format. The formatting module **48** can format the query results based on the specified format, and transfer the formatted output to the server **16** through the API **33**. In an embodiment, the formatted results can be transferred to the server **16** in XML format. A web application on the server **16** or another location can transform the XML search results into a desired presentation style using, for example, the W3C standard extensible stylesheet language transformation (XSLT) and HTML.

Referring to FIG. 5, there is a diagram for an embodiment **50** where the search results can be presented to a server application in a ready-to-display format. As was shown in FIG. 4, in FIG. 5, a server **16** can provide query information, dictionary selection, and output format to the data access module **46** of the query

1   processor **44**. The data access module **46** can provide the query

2   information and dictionary selection to the query translator

3   module **34** that utilizes the specified dictionary **18** to generate a

4   customized search or query. The customized search can be

5   provided to the data access module **46** and executed against the

6   appropriate data source **20**. The results of the search can be

7   returned to the formatting module **48** via the data access module

8   **46**, with the specified output format. The formatted search

9   results can be provided to the server **16** for display. In the

10   illustrated system of FIG. 4, the formatted results can be fully

11   customizable HTML templates for output to the internet, and can

12   include colors, headers, footers, and other customizable

13   characteristics to match the web site. The HTML can additionally

14   and optionally include graphs, pie charts, bar graphs, reports,

15   and spreadsheets that can be displayed using, for example,

16   ActiveX control or Java applet.

17   As indicated with reference to FIG. 4, the system and

18   methods according to FIG. 5 can be practiced with multiple query

19   translators **34** and/or dictionaries **18**. Additionally, the data

20   sources **20a, 20b** can be multiple and can include other data

21   sources than illustrated. In the embodiments herein, although

1   identification can be provided with a query request, some

2   embodiments may not utilize query information.

3   Referring now to FIG. 6, there is shown an embodiment **60**

4   wherein a "broker dictionary" **18e** can be utilized to interface to

5   other dictionaries and data sources. One of ordinary skill in

6   the art will recognize from the description of the methods and

7   systems provided herein, that a server **16** that is not

8   illustrated, can be associated with the broker dictionary **18e**.

9   The illustrated broker dictionary **18e** can include, for example,

10   URLs of other servers at different locations in a local or other

11   network (e.g., internet, intranet, LAN, WAN, etc.) that have

12   relevant data sources and/or dictionaries. Dictionaries to which

13   the broker dictionary **18e** can communicate can be referred to

14   herein as broadcast dictionaries. In an embodiment, the broker

15   dictionary **18e** can provide an interface for a subscriber **16** with

16   multiple servers. The multiple servers can maintain different

17   customized dictionaries, or can share the broker dictionary **18e**.

18   In some embodiments, the broker dictionary **22** can interface to

19   multiple subscribers **16** and/or data sources **20**.

20   According to the FIG. 6 system, the broker dictionary **18e**

21   can receive query information from the initiating device **12** and

1   the broker dictionary **18e** can filter the search request to

2   eliminate broadcast dictionaries and/or data sources **20** that do

3   not include data relevant to the query information. The broker

4   dictionary **18e** can therefore include sophisticated and

5   intelligent filters to eliminate unneeded broadcast search

6   requests. Those with ordinary skill in the art will recognize

7   that the broker dictionary **18e** can include the attributes

8   previously provided to dictionaries in general, including but not

9   limited to language translation, synonym generation, natural

10   language processing, business rules, etc.

11   The broker dictionary **18e** can relay or broadcast query

12   information, as processed by the broker dictionary **18e**,

13   unprocessed, or a combination thereof, to the selected broadcast

14   dictionaries **18f, 18g, 18h** and other data sources **20e, 20f, 20g**.

15   For example, in the illustrated system of FIG. 5, the broker

16   dictionary **18e** can process the query information to provide a

17   customized query that can be provided to the non-broadcast

18   dictionary data sources **20e, 20f, 20g**. Similarly, the broadcast

19   dictionaries **18f, 18g, 18h** can receive either the customized

20   query information or the original query information from the

21   initiating device **12**. In either case, the broadcast dictionaries

22   **18f, 18g, 18h** can process the received query information from the

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broker dictionary **18e**, and distribute a customized query to one or more data sources **20h, 20i, 20j** as provided previously herein. The customized query results from the different data sources **20e-20j** can be transmitted or otherwise transferred to the broker dictionary **18e**. The illustrated broker dictionary **18e** can receive customized query search results and format the results to present a single result package to the initiating device **12** or other server **16** or application as provided herein. In some embodiments, the broker dictionary **18e** can filter the search results before transferring or communicating the search results as provided herein.

Those with ordinary skill in the art will recognize that the systems and methods herein can include one or more databases that can be in communication with the servers **16** but are not otherwise illustrated in the representative figures. For example, a database can be utilized to maintain information based on user identity and privileges, broker dictionaries and associated broadcast dictionaries, rules for filtering query results, etc.

Accordingly, it can be understood that the methods and systems disclosed herein can be applied to a variety of queries. For example, the query information initially submitted can be a

1   question, such as "How far is bank XXX from home?", such that

2   data pertinent to the user (e.g., "home") and data related to a

3   another sensor or entity (e.g., mapping program or distance

4   calculator) can be integrated with the query information to

5   provide an appropriate response. Questions can be presented in

6   succession, and results from one question can be a basis as input

7   to the dictionary for subsequent questions.

8   The techniques described herein are not limited to a

9   particular hardware or software configuration, and may find

10 applicability in many computing or processing environments. The

11 techniques can be implemented in hardware or software, or a

12 combination of hardware and software. The techniques can be

13 implemented in one or more computer programs executing on one or

14 more programmable computers that include a processor, a storage

15 medium readable by the processor (including volatile and non-

16 volatile memory and/or storage elements), one or more input

17 devices, and one or more output devices.

18   The computer program(s) is preferably implemented in one or

19 more high level procedural or object-oriented programming

20 languages to communicate with a computer system; however, the

1   program(s) can be implemented in assembly or machine language, if

2   desired. The language can be compiled or interpreted.

3   The computer program(s) can be preferably stored on a

4   storage medium or device (e.g., CD-ROM, hard disk, or magnetic

5   disk) readable by a general or special purpose programmable

6   computer for configuring and operating the computer when the

7   storage medium or device is read by the computer to perform the

8   procedures described herein. The system can also be considered

9   to be implemented as a computer-readable storage medium,

10   configured with a computer program, where the storage medium so

11   configured causes a computer to operate in a specific and

12   predefined manner.

13   One potential advantage of the methods and systems is that

14   an internet user may obtain reliable, accurate, and efficiently

15   organized information in response to a search or query request.

16   What has thus been described is a method and system for

17   providing efficient searching of devices on communications

18   networks, such as servers on the internet, using an application

19   that can survey a subscriber's server that can include a catalog

20   and database, and use the formatting information and data from

21   the survey to create a dictionary customized to the subscriber's

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1 data sources. A user seeking information can initiate a search

2 from an initiating device using keywords, natural language terms,

3 connectors, expressions, etc., wherein such query information can

4 be transmitted to various subscriber customized dictionaries.

5 The customized dictionaries can customize the query based on

6 respective subscriber databases and text documents, text search

7 engines, etc., to produce an accurate search result. The search

8 results can be filtered and integrated for presentation to the

9 initiating device. Search results can be customized using user

10 preference or profile information.

11 Although the methods and systems have been described

12 relative to specific embodiments thereof, the methods and systems

13 are not so limited. Obviously many modifications and variations

14 may become apparent in light of the above teachings. For

15 example, although the illustrated embodiment presented herein

16 related to the internet, the methods and systems can be applied

17 to searching other devices on other communications networks.

18 Although HTML and XML languages were utilized to facilitate the

19 searching, other languages may be utilized. The survey program

20 can be run locally on a server, or remotely from another

21 platform. Similarly, a dictionary can be accessed and/or managed

22 locally or remotely using wired or wireless communications

systems and methods. Results of customized queries can be
aggregated at a server having multiple data sources, and
thereafter transferred to the system server that can aggregate
the results. In another embodiment, an application residing on
the initiating device can receive and aggregate the results for
presentation on the device. In an embodiment, search results can
be displayed according to a user identification and/or
information stored in a central database or local memory that
includes user-specific preferences. The preferences can indicate
suppliers, price, and other search-relevant criteria that can be
submitted with the natural language search terms. In embodiments
utilizing a user account for preferences, the respective
subscriber dictionaries can integrate the user's preferences with
the search terms to increase the probability of satisfying a
search query for a user. In another embodiment, a user can be
prompted for preference criteria, while in another embodiment,
user identification data can be entered and submitted with the
search criteria. Upon receiving the user identification data, a
dictionary can cause a pre-stored user profile to be extracted
and incorporated into the search.

In some embodiments, a user can be presented with search
results and can select the desired results for purchase. Search

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1 results can be accompanied by a URL of the order processing

2 system that can be used to order the product; and, when the user

3 selects the item, the relevant product information can be

4 submitted to the purchasing system to initiate the purchase

5 process. In an embodiment, the user's selection of a product can

6 provide a transition to an order basket or other ordering scheme

7 that can be provided by the initiating website, the subscriber's

8 website, or an alternate website. In these embodiments, the

9 ordering scheme can interface to a browser or other interface at

10 the initiating device.

11 Data sources and dictionaries do not have to reside on the

12 same server, medium, etc. Additionally, methods of presenting a

13 query and presenting query results can be integrated with instant

14 messaging and/or email.

15 Many additional changes in the details, materials, and

16 arrangement of parts, herein described and illustrated, can be

17 made by those skilled in the art. Accordingly, it will be

18 understood that the following claims are not to be limited to the

19 embodiments disclosed herein, can include practices otherwise

20 than specifically described, and are to be interpreted as broadly

21 as allowed under the law.